

Wind Energy

Iowa's Abundant Harvest

Iowa's commitment to renewable energy stems from a rich abundance of natural resources and a goal to expand economic opportunities in the state. One of the most significant opportunities to harvest those resources is wind energy.

Iowa: Leading the Nation

Iowa is a national leader in wind energy production. In recent years, the state has consistently been the third largest producer of electricity from wind, trailing only California and Texas in the amount of wind energy capacity installed.

More than 40 percent of the state's land area offers wind generation capabilities, giving Iowa the potential to produce several times its own annual electrical consumption through wind power.

Iowa has nearly 600 wind turbines with a total nameplate capacity of more than 423 MW, as of October 2003. This is enough power to generate electricity for more than 130,000 homes per year and avoid more than 1.3 million tons of carbon dioxide emissions annually.

Iowa wind energy projects come in various sizes, ranging from single wind energy systems owned by an individual, business or organization, to large wind farms comprised of dozens or hundreds of large turbines.

Environmental, Economic Benefits

Iowa's environment reaps significant benefits from wind energy development. Wind turbines harness an abundant, renewable energy resource, and no air pollutants are emitted when electricity is produced from wind.

Wind energy production also strengthens Iowa's economy – most significantly in rural areas where wind turbines are usually installed. Property owners can lease their land to wind developers for turbine installations, and a wind turbine can offset energy needs of a private home, farm or business. Local utilities can install wind turbines to decrease their reliance on imported and price-volatile fossil fuels. In addition, wind energy projects generate local property tax revenue and create construction and maintenance jobs.

Learn More

Inside, find out how Iowans are using wind energy to help the environment, reduce electricity bills and create economic development opportunities.

Schools, small businesses and property owners have all discovered the advantages of installing small turbines, while developers and farmers are reaping the benefits of large wind farms.

The back cover offers information on financial incentives, state and national resources, and Web sites focusing on wind energy.

Iowa Schools: Pioneers in Wind Energy

Some of the earliest developers of wind energy in Iowa have been school districts. In 1993, Spirit Lake Community School District was the first school system in Iowa to adopt wind energy. Currently, eight Iowa school districts operate wind turbines, with additional installations planned.

Wind turbine installations have great potential for financial savings in schools. After applying energy savings to pay off the loan used to finance the turbine – which can take less than 10 years – a school receives nearly free electricity.

Because the average life of a turbine is 20 to 30 years, wind power can yield substantial savings over time, allowing schools to use funds for their first priority – educating children. Some schools also receive payments from their local utility

for the excess electricity generation they feed to the grid.

In addition to financial savings, Iowa school districts are integrating their wind turbines as educational tools in the classroom, teaching students the science behind renewable energy.

Schools can be attractive candidates for wind energy production because peak demand for electricity often corresponds to the availability of wind energy resources. In Iowa, winds are usually strongest in the winter and early spring, times when schools are in session. Winds are usually weakest in the summer, when school is out and electricity demand is lower.

Many of the school districts that



The Eldora-New Providence Community School District's wind turbine began generating electricity in October 2002. The 750 kW turbine should generate about 1.5 million kWh of electricity per year – 1.5 times the amount the school district uses annually. Excess production will be sold to Alliant Energy.

have installed wind turbines have used financial assistance programs, including low-interest loans, making the initial investment easier.

Investing in a wind turbine can create educational opportunities, financial incentives and a cleaner environment for Iowa schools.

Further Help:

For more information about wind energy, contact the Iowa DNR at:
Phone: (515) 281-5918
Web site: www.iowadnr.com/energy/

Small Turbines Lower Bills, Save Resources



Bill Hunter of Earlham installed his 20 kW wind turbine in 1996. Since then, the turbine has produced a significant portion of his home's electricity – an average of 15,000 kWh per year.

Several dozen small, private wind turbines are generating electricity across Iowa.

Depending on the available wind resource, a small wind energy system can lower a property owner's electricity bill by 50 to 90 percent and may help avoid the high cost of extending utility power lines to remote locations.

About 30 turbines in Iowa are privately owned, and a handful of small businesses have discovered the advantages of installing a turbine.

A small turbine can provide electricity for properties on or off the local utility grid. If the property is connected to the grid, the local utility company can provide electricity when the

wind is not blowing. If the wind turbine produces more electricity than needed, the excess can be fed to the grid. An off-grid home can use an alternate energy system to provide electricity when the turbine is not producing enough electricity.

A small wind electricity system may work for a property owner if: 1) the property has a good wind resource; 2) the property is located on at least one acre of land; 3) local zoning codes allow wind turbines; and 4) the property owner is willing and able to make a substantial long-term investment.

Small wind turbines can range in size from 400 watts to 100 kilowatts. For a typical home, a wind turbine in the range of 5 to 15 kW is required to make a significant contribution to the home's electricity needs. Cost for a small system can vary, depending on size, application and service agreements with the manufacturer. Financial incentives and assistance are available to help offset the cost of the system.

Installing a wind turbine at a home or small business can provide real results in reducing bills and saving energy.

Large Wind Farms Growing in Rural Iowa

Large-scale wind farms are cultivating rural economic development in Iowa. Four major wind farms in northwest and north central Iowa are producing electricity for Iowans, and additional large-scale projects are in planning and development stages.

Since the late 1990s, Iowa's wind energy production has increased at a rapid pace. The first large-scale wind farms were completed in 1999 when 55 turbines in Cerro Gordo County and 257 wind turbines in Buena Vista and Cherokee counties came online. The 89-turbine Top of Iowa Wind Farm in Worth County started producing electricity in December 2001, and the 148-turbine Hancock County Wind Farm became operational in December 2002.

The creation of a large-scale wind farm begins as wind developers study and choose locations for turbines with the strongest wind resources. Farmers lease their land to developers, usually taking only a quarter acre of land out of production for each turbine. Developers find buyers, such as utility companies, for the electricity produced by the wind farm.

The economic benefits of wind farms range from lease payments paid to farmers with turbines on their land to an increased tax base for rural communities. In addition, construction and maintenance of the turbines leads to new jobs and economic development.

Additional planned wind projects are expected to more than double Iowa's wind generation capacity. Top of Iowa Wind Farm developers have plans for several additional wind farms across the state. Clipper Windpower is planning to complete a 29-turbine wind farm, with a projected capacity of 43.5 MW, near Spirit Lake, and MidAmerican Energy Company has announced its intention to build a 310 MW wind farm in Iowa.

As wind farms continue to grow in Iowa, so will economic development and opportunities for clean energy resources.



Municipal Utilities Harvest Wind Power

Wind production is the latest addition to the electricity mix at a growing number of public power systems. Wind energy allows small utilities to avoid fossil fuel price fluctuations and diversify with environmentally-friendly energy sources.

Waverly Light and Power (WLP) has led the way for local utilities in wind energy development. In 1993, WLP became the first municipal utility west of the Mississippi River to own and operate a wind facility. In 1999, WLP invested in two turbines at the Storm Lake Wind Power Generation Facility in Buena Vista County, and in 2001 the utility replaced its original 80 kW turbine near Waverly with a 900 kW turbine.

Other local utilities are following in WLP's footsteps. In 1998, seven municipal utilities created the Iowa Distributed Wind Generation Project, a three-turbine facility near Algona, to gain first-hand experience at running a small wind farm. Additionally, both Wall Lake and Lenox electric utilities installed wind turbines in the fall of 2003.

Wind energy is a financially feasible option for many communities. Programs like the Renewable Energy Production Incentive, a federal credit of 1.5-1.8 cents per kWh for the first 10-year period of operation, have made many municipal utility wind projects financially more attractive.

Utilities also can use wind energy to fulfill green power requirements. As of Jan. 1, 2004, all electric utilities in Iowa must offer customers the option of purchasing electricity from renewable energy sources or to make contributions toward renewable energy development in Iowa.

Wind energy can be a smart solution for local Iowa utilities, creating financial benefits and satisfying a demand for renewable energy sources.



The Lenox Municipal Utility installed its 750 kW wind turbine in October 2003. The turbine can produce 1.7 million kWh per year, about 10 percent of the utility's total electrical demand. An Iowa Department of Economic Development grant paid \$400,000 of the turbine's \$950,000 cost.

(Left): The Cerro Gordo County wind farm near Clear Lake began producing electricity in 1999. The 55-turbine facility has a nameplate capacity of 42 MW. FPL Energy, Inc., one of the largest wind energy producers in the United States, owns the wind farm.

Wind Energy Incentives & Resources

Incentives and Programs

Local Option Special Assessment of Wind Energy Devices

Incentive: Special property tax assessment

Summary: This statute allows any city or county to pass an ordinance assessing wind energy conversion equipment at a special valuation for property tax purposes.

Wind Energy Equipment Sales Tax Exemption

Incentive: 100 percent sales tax exemption

Summary: Iowa law exempts from the state sales tax the total cost of wind energy equipment and all materials used to manufacture, install or construct wind energy systems.

Net Metering

Incentive: Receive credit for excess electricity generated

Summary: Iowa's rate-regulated electric utilities are obligated to interconnect with renewable energy systems and credit energy system owners for excess electricity produced.

Iowa Energy Center Alternate Energy Revolving Loan Program

Incentive: Up to 50 percent of the financed loan at zero percent interest; maximum limit \$250,000

Summary: The AERLP provides funding for renewable energy projects.

Value-Added Agricultural Products and Processes Financial Assistance Program

Incentive: Forgivable and traditional loans; maximum limit \$525,000

Summary: Administered by Iowa Department of Economic Development, the program provides loans to encourage renewable energy projects in Iowa.

Iowa Energy Bank

Incentive: Technical and financial assistance

Summary: An energy management program that uses energy cost savings to repay financing for energy management improvements in public and non-profit facilities.

2002 Farm Bill:

Renewable Energy Systems and Energy Efficiency Improvements

Incentive: Low-interest loans, loan guarantees and grants.

Summary: Allows direct financial assistance to farmers, ranchers and rural small businesses for the purchase of renewable energy systems.

Value-Added Agricultural Product Market Development

Incentive: Grants; maximum amount \$500,000

Summary: Competitive grants to assist producers of value-added agricultural products, including renewable energy systems, to develop feasibility studies, business plans and marketing plans.

Wind Energy Web Sites

Iowa DNR Energy & Waste Management Bureau:

www.iowadnr.com/energy/

Iowa Energy Center:

www.energy.iastate.edu

U.S. DOE's Energy Efficiency and Renewable Energy Network:

www.eere.energy.gov

U.S. DOE's Wind Powering America:

www.eere.energy.gov/windpoweringamerica/

Database of State Incentives for Renewable Energy:

www.dsireusa.org

The American Wind Energy Association:

www.awea.org

The National Wind Coordinating Committee:

www.nationalwind.org

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